

CLAIMS

1. A method for processing aluminum in a furnace,  
5 in which an aluminum-containing material and, optionally, one or more salts, are introduced into the furnace, this material is melted by heating using at least one burner supplied with oxidizer and with fuel, in order to obtain molten aluminum possibly covered  
10 with a slag comprising, in particular, alumina and at least one salt, and the carbon monoxide CO and/or hydrogen H<sub>2</sub> concentration is measured in the furnace atmosphere or in the flue gases, characterized in that the oxidizer supplied to at least one burner comprises  
15 over 10% by volume of oxygen, preferably over 21% by volume of oxygen, and in that the method comprises a final phase for decreasing the oxidation of the molten aluminum, during which the oxidizer flow rate is substantially constant while the flow rate of fuel  
20 injected into at least one burner is a function of the carbon monoxide and/or hydrogen concentration in the atmosphere or the flue gases or vice versa, this carbon monoxide and/or hydrogen concentration being regulated to a setpoint C2 of between 3 vol% and 15 vol%.

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2. The method as claimed in claim 1, characterized in that the oxidizer comprises over 88 vol% of O<sub>2</sub>, preferably over 95 vol% of O<sub>2</sub>.

30 3. The method as claimed in either of claims 1 and 2, characterized in that the oxidizer is industrially pure oxygen.

4. The method as claimed in claim 1, characterized  
35 in that the fuel is selected from natural gas, hydrocarbons, and light or heavy fuel oil.

5. The method as claimed in one of claims 1 to 4, characterized in that the volumetric ratio of oxygen to

fuel is maintained between 1 and 5, preferably between 1.5 and 3.

6. The method as claimed in one of claims 1 to 5,  
5 characterized in that the carbon monoxide and/or hydrogen concentration is maintained substantially constant throughout this oxidation limitation phase at a value C2 of between 3 vol% and 15 vol%, preferably between 6 vol% and 10 vol%.

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7. The method as claimed in claims 1 to 6, characterized in that the oxidation limitation phase is preceded by a hydrocarbon combustion phase during which substantially all the organic compounds present in the  
15 material are destroyed by pyrolysis.

8. The method as claimed in claim 7, characterized in that the hydrocarbon combustion phase is considered to terminate when the measured value of the ratio R of  
20 the volumetric flow rate of oxygen to the volumetric flow rate of fuel falls below a predefined value S.

9. The method as claimed in claims 7 and 8, characterized in that a stabilization phase takes place  
25 with a measured CO and/or H<sub>2</sub> concentration regulated to the setpoint C1, this phase terminating when the ratio R reaches its minimum.

10. The method as claimed in one of claims 1 to 9,  
30 characterized in that the aluminum oxidation limitation phase terminates with the reintroduction, into the furnace, of a new charge of aluminum-containing material.

35 11. The method as claimed in one of claims 1 to 10, characterized in that the CO concentration is measured using a laser diode.

12. The use of a laser diode for measuring CO in a method as claimed in at least one of the preceding claims.